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Reproductive Performance in Large White Yorkshire Crosses

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Abstract: The litter traits of Large White Yorkshire crosses viz. LWY x desi (50% LWY, n= 59) and LWY x 50% LWY (75% LWY, n = 70) in three consecutive generations (F_1, F_2 and F_3) were recorded. The data were analysed on both the genetic groups in three generations for reproductive traits viz. litter size at birth, litter size at weaning, litter weight at birth and litter weight at weaning. The overall mean litter size at birth and weaning were 5.26 ± 0.22 and 4.86 ± 0.20 respectively. The litter size at birth did not vary significantly between F_2 and F_3 while both differed significantly (P<0.01) with F_1.

Key words: **Large White Yorkshire crosses, Genetic Groups, Litter size, Litter weight**

I. Introduction

Improvement of reproductive traits will improve efficiency of swine production. There is a reduction of performance and especially reproductive traits suffer a great loss when exotic germplasm is introduced into tropical climate. All India Coordinated Research Programme on Pigs has placed considerable importance on *desi* pigs, Large White Yorkshire (LWY) and their crosses. Study of the reproductive traits in the LWY crosses helps us understand their performance in this environment and enables us to take appropriate measures for their improvement. This paper presents the litter traits of Large White Yorkshire (LWY) crosses at All India Coordinated Research Project (AICRP) on pigs at Livestock Research Station, Kattupakkam.

II. Materials and Methods

Data on litter traits of Large White Yorkshire (LWY) crosses LWY x *Desi* viz. 50% LWY (n = 59) and 75% LWY (n = 70) in three consecutive generations (F_1, F_2 and F_3) were recorded at the AICRP unit of Livestock Research Station, Kattupakkam. All the pigs were farm-bred and raised under normal feeding, housing and other management practices. Weaning of the piglets was carried at eight weeks of age. The litter sizes at birth and at weaning were the number of piglets born to the individual gilt or sow in a single farrowing at the time of birth and the number of piglets at weaning respectively. Litter weight at birth and at weaning were the total weight of live piglets at birth and weaning respectively. The data was recorded on both the genetic groups for the reproductive traits viz. Litter size at birth and weaning and litter weight at birth and weaning and were analysed by method of least-squares (Harvey 1979) with mean comparisons by Duncan's Multiple Range Test (DMRT) (Kramer, 1957).

III. Results and Tables

The least-squares means of the reproductive traits in LWY crosses are presented in the Table.

Litter size at birth

The overall mean litter size at birth was 5.26 ± 0.22. The litter size at birth for 50% LWY crosses was 4.71 ± 0.32 which was significantly (P<0.05) lower than the litter size at birth for 75% LWY crosses (5.82 ± 0.30). Kumari *et al.* (2008) reported a litter size of 6.77 ± 0.16 for 75% LWY crosses which was higher than that reported in this study. Prasanna *et al*. (2009) reported that the 50% LWY had a litter size of 6.73 ± 0.16 whereas the corresponding value for 75% was 6.83 ± 0.16. The litter sizes reported by Mishra *et al.* (1985), Mohanty *et al.* (1986), Kumari *et al.* (2008) and Prakash *et al.* (2008) were comparable to that in the present study. Among the generations the litter size in F_1 was 3.89 ± 0.41 which improved upon the successive generations as 5.75 ± 0.37 and 6.15 ± 0.36. The litter size at birth did not vary significantly between F_2 and F_3 while both differed significantly (P<0.01) from the F_1. The low value for litter size in the F_1 generation could have been the reason for the lower value of overall litter size since the F_3 75% crosses showed almost a comparative value as that reported by Kumari *et al.* (2008).

Litter size at weaning

The overall mean litter size at weaning was 4.86 ± 0.20. The litter size at weaning for 50% LWY crosses was 4.26 ± 0.30. The 75% LWY crosses had a significantly higher (P<0.01) litter size of 5.46 ± 0.28. Significant (P<0.01) effect of genetic group on litter size at weaning was also observed by Nandakumar *et al.* (2004) in *desi*, LWY and their crosses. In a study by Prasanna *et al.* (2009) the 50% LWY had a litter size at weaning of 6.13 ± 0.16 whereas the corresponding value for 75% was 6.31 ± 0.16. Prakash *et al.* (2008) reported a litter size at weaning of 7.27 ± 0.51 and 4.70 ± 0.47 for 50% and 75% LWY crossbreds respectively. The value reported for 75% LWY was lower than the value observed from this study. Among the generations the litter size at weaning ranged from 3.49 ± 0.37 to 5.70 ± 0.33. All the three generations differed significantly (P<0.01) with respect to litter size at weaning.

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Litter weight at birth

The overall mean litter weight at birth was 5.83 ± 0.26 kg. The mean litter weight at birth for 50% LWY crosses was 5.11 ± 0.30. The 75% LWY crosses had a significantly high (P<0.01) litter weight at birth of 6.54 ± 0.35 kg. In a similar study by Prasanna *et al.* (2009) mean litter weight at birth was 7.53 ± 0.12 kg. The mean value obtained from this study was comparable with that reported by Mishra *et al.* (1986) but lower than that reported by Kumari *et al.* 2008 and Prakash *et al. 200*8. The significant effect of genetic group on litter weight at birth and weaning was also observed by Nath *et al.* (2002), Kotirathnam *et al.* (2002), Nandakumar *et al.* (2004) and Prakash *et al.* (2008). Among the F_1, F_2 and F_3 generations the mean value was 4.22 ± 0.48, 5.95 ± 0.44 and 7.30 ± 0.42 kg respectively. The litter weight of the third generation was comparable to the values obtained for LWY crosses in the earlier reports (Kumari *et al.* 2008 and Prakash *et al.* 2008).

Litter weight at weaning

The overall mean litter weight at weaning was 36.59 ± 1.45 kg. The litter weight at weaning for 50% LWY crosses was 30.70 ± 2.13 kg which was significantly (P<0.05) lower than the litter weight at weaning of 42.48 ± 1.98 kg for 75% LWY crosses. Prakash *et al.* (2008) reported a litter weight at weaning of 64.38 ± 4.64 kg for 50% LWY crosses. In his study the 50% crosses had a significantly higher body weight than that of the 75% crosses which had a body weight of 51.91 ± 4.33 kg. The litter weight at weaning was found to be 58.9 ± 1.40 kg as reported by Prasanna *et al.* (2009) which was higher than that reported in our study. The litter weight at weaning in this study was lower than the range (55.14 to 64.23 kg) quoted in LWY-*desi* crosses (Kumari *et al.* 2008 and Prakash *et al.* 2008) but the weight of 75% cross's was comparable to the weaning weight (43.30 kg) reported by Chatterjee *et al.* (1988) in LWY crosses. Among the generations the F_1 generation had a very low weaning weight, 26.14 ± 2.69 kg which significantly (P<0.01) differed from the respective values of 38.45 ± 2.46 kg and 45.16 ± 2.39 kg for the F_2 and F_3 generations. The better performance of F_3 is indicative of the ability of the genetic group to adapt to the environmental conditions.

IV. Conclusion

The present study indicated that the 75% crosses performed better than the 50% crosses for all the reproductive traits and the performance of the crosses improved over generations.

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Table: Least-squares means (± S.E.) of Litter traits in Large White Yorkshire crosses

	Litter size		**Litter weight (kg)**	
	At birth	**At weaning**	**At birth**	**At weaning**
Overall (n = 129)	**5.26 ± 0.22**	**4.86 ± 0.20**	**5.83 ± 0.26**	**36.59 ± 1.45**
Genetic group	*	**	**	**
50 % LWY (n = 59)	5.82 ± 0.30	5.46 ± 0.28	6.54 ± 0.35	42.48 ± 1.98
75 % LWY (n = 70)	4.71 ± 0.32	4.26 ± 0.30	5.11 ± 0.38	30.70 ± 2.13
Generation	**	**	**	**
F_1 (n = 37)	3.89 ± 0.41[b]	3.49 ± 0.37[c]	4.22 ± 0.48[c]	26.14 ± 2.69[c]
F_2 (n = 45)	5.75 ± 0.37[a]	5.39 ± 0.34[b]	5.95 ± 0.44[b]	38.45 ± 2.46[b]
F_3 (n = 47)	6.15 ± 0.36[a]	5.70 ± 0.33[a]	7.30 ± 0.42[a]	45.16 ± 2.39[a]

Figures in parentheses are the number of observations.
** Significant at P < 0.01; * Significant at P < 0.05; NS – Non significant.